

present the scheme has merely been brought before the Hebdomadal Council, and has, as yet, assumed no definite shape.

CAMBRIDGE.—The Local Examinations and Lecture Syndicate have presented to the Senate their twentieth annual report. The most important event of the year has been the establishment of the University Extension and Technical College at Exeter. The college has been established by the co-operation of the Town Council of Exeter, the University Extension Committee of Exeter, and the Syndicate, and Mr. A. W. Clayden, of Christ's College, has been appointed principal. The work done for County Councils under the authority of the Syndicate has been continued during the past year. There has been a considerable diminution in the area covered, as County Councils have been able to utilise to a greater extent than before the services of local teachers, and have spent a larger proportion of their available funds in grants in aid of permanent institutions for technical teaching. On the other hand, the reports received from lecturers indicate considerable improvement in the quality of the work done. About 650 students attended the summer meeting, of whom 150 were men and 500 women. On the whole the work done was satisfactory, though a certain number of students attempted too many subjects. It is not considered desirable to hold such meetings oftener than once in two years, but classes on a smaller scale may satisfactorily be held in the alternate long vacations. From Mr. Arthur Berry's report to the Syndicate it appears that the stimulus given to the work of the local lectures last year by the activity of the County Councils in the matter of technical education has lost a good deal of its effect, as more permanent institutions for educational purposes are gradually being organised. Not only have literature and history thus suffered, but courses on branches of science not of obviously practical utility (such as astronomy) have tended to be displaced by more "technical" subjects. It is satisfactory to learn that such engagements as have already been made for the ensuing winter indicate a distinct reaction against the exclusive study of "bread and cheese" subjects.

In resigning office on September 30, the late Vice-Chancellor, Dr. Peile, called attention to the lack of funds for research in several of the scientific departments. He is now able to announce that an anonymous member of the Senate has placed in his hands £100 for the support of higher work in the Pathological Department during the coming academical year.

A fire, which took place at the Pitt Press last week, has necessitated the temporary evacuation of the room occupied by the Registrar. The Old Library of Pembroke College has been placed at his disposal by the Master and Fellows, and the business of the office will be carried on there during the present term.

The scheme for examinations in agricultural science under a managing syndicate was non-placeted on November 9, but was carried by a very large majority. The proposal to postpone the conferring of Honours degrees to the Long Vacation, in order to give more time for the Tripos examinations, was rejected.

The *University Reporter* of November 14 contains notices of scholarships in Natural Science open for competition to non-residents at Peterhouse, Clare, Pembroke, King's Queen's, St. John's, and Sidney Sussex. The examinations will be held in December and January next.

TRINITY COLLEGE, DUBLIN.—There is during this term a large increase in the number of students interested in the study of biology; so large, in fact, that the accommodation in the Botanical Laboratory has had to be increased. This is a pleasing feature in a university so long devoted to classical pursuits.

At the recent Moderatorship Examinations, three candidates, C. J. Patten, F. K. Boyd, and N. H. Alcock, obtained Senior Moderatorships, and were awarded gold medals in Natural Science (Botany, Zoology, Geology, and Physiology). During the week the University Experimental Science Association held its opening meeting, when a very large audience assembled to hear Dr. Joly, F.R.S., deliver a lecture on "Some Applications of Photography." The Provost, Dr. Salmon, occupied the chair.

The *British Medical Journal* says that steps are being taken to arrange for a deputation representing the university colleges in England to wait, shortly, upon the Chancellor of the Exchequer, to urge upon him the propriety of increasing the annual parliamentary grant. A sum of £15,000 has been

granted annually since 1890, and when this sum was first placed upon the estimates, it was understood that the question would be reviewed at the end of five years. A Treasury Committee, consisting of Sir Henry Roscoe, Mr. George Curzon, Prof. Bryce, Mr. R. G. C. Mowbray, and Mr. W. J. Courthope, have reported recently in favour of the grant being doubled, pointing out that all educational work connected with science is increasing yearly in cost, and that the growth in the number of students and the enlargement of the teaching staff have contributed to strain the resources of the colleges.

SCIENTIFIC SERIALS.

Bulletin of the New York Mathematical Society, vol. iii. No. 1. (New York: Macmillan, October, 1893.)—A congress of mathematics and astronomy was opened at Chicago on August 21, and this number commences with Dr. Felix Klein's inaugural address. It is brief but not witty, and merely sketches some of the papers to be read, and closes with the remark that mathematicians must go farther than to form "mathematical societies." "They must form international unions, and I trust that this present congress at Chicago will be a step in that direction." Prof. T. H. Safford narrates briefly, in his remarks on "instruction in mathematics in the United States," the history of the noteworthy rise in the general standard of mathematical teaching within the last few years. Prof. Ellery Davis reviews four recent geometries, viz. those by Hopkins, Dupuis, W. B. Smith, and Halsted. Prof. Tyler analyses the papers read at the Chicago congress, and Prof. Waldo gives a brief account of the American Association meeting at Madison on August 16-23. Three pages of notes of mathematical doings, and eight pages of new publications follow. This last feature of the *Bulletin* is a very prominent and highly valuable one.

THE *American Meteorological Journal* for November contains an account of the second annual meeting of the American Association of State Weather Services, held in Chicago, on August 21-23, 1893. The meeting was well attended, and resolutions were adopted on various subjects, among which may be mentioned the issue of weekly crop bulletins. It was also recommended that the bottom of thermometer screens should be four and a half feet above the ground; this would make the thermometers about a foot higher than is recommended in this country. It is stated that experiments made during the past year prove the former elevation to give the best results.—Mr. C. E. Linney read a paper on the value of frost predictions, and the best method of making them locally. The author is of opinion that with a knowledge of the ordinary weather signs an observer can, by the aid of the wet and dry bulb thermometers, form a good idea of what minimum temperature to expect during the night.

In the *Transactions of the Austrian Geological Survey* we remark an important communication, made by Mr. Friedrich Teller, "On the so-called Granite of the Bacher Mountains in South Steiermark." It seems that the familiar term, "granite of the Bacher," has been entirely misapplied. In the eastern part of these mountains the rock is granitic *gneiss*, forming a dome-shaped core beneath the crystalline schists; while the so-called granite in the western part is an intrusive *porphyrite*, younger than the whole series of schists and phyllites, and possibly of the same age as the porphyrite which penetrates Triassic and Jurassic strata in the neighbouring district.—Dr. A. Kornhuber gives the name of *Carosaurus Marchesetti* to a new Saurian genus from the Karst district. It was found in the same cretaceous shales as *Acteosaurus*, a genus described thirty years ago by Hermann Meyer, and was erroneously thought to be merely a larger specimen of Meyer's genus.

SOCIETIES AND ACADEMIES.

PARIS.

Academy of Sciences, November 6.—M. Lœwy in the chair.—On Goubet's joint and its application to marine screw-propellers, by M. H. Resal. This is a mathematical investigation of the action of a joint capable of making the propeller act as supplementary steering gear, and of adapting it to submarine navigation. It is shown to possess several advantages over the

similar American Clemens joint.—On a class of differential equations whose general integral is uniform, by M. Emile Picard.—Significance of the variety of organs in the gradation of vegetable species, by M. Ad. Chatin.—On a Nymphaea bed recently found and explored in the Aquitanian of Manosque, by M. G. de Saporta.—On equations of the second order with fixed critical points, and univocal correspondence between two surfaces, by M. Paul Painlevé.—On certain ordinary differential equations, by M. Alfred Guldberg.—On certain families of gauche cubes, by M. Lelievre.—On the nature of the reflection of electric waves at the end of a conducting wire, by MM. Kr. Birkeland and Ed. Sarasin.—Observations upon the preceding communication of MM. Birkeland and Sarasin, by M. H. Poincaré. This is an application of Maxwell's theory to the phenomena of propagation of energy into space round the end of a conducting wire along which electric waves are passing. It is shown that the deductions from the theory are in general accord with the facts observed.—On the measurement of coefficients of induction, by M. H. Abraham. The employment of a differential galvanometer in these measurements permits of an accurate determination within 1 per cent., and a reading to within 0.1 per cent. without much difficulty. The induced currents from a commutator regulated by a stroboscopic method are sent through one circuit of a differential galvanometer, the deflection being compensated by a continuous current derived from the same battery. The commutator is then stopped, and a current equivalent to the induced current is derived from the primary circuit through a resistance r , and sent through the secondary circuit, r being chosen so as to establish equilibrium in the differential galvanometer. Then this actual resistance r may be put equal to the fictitious resistance nM obtaining while induction was going on, and we have $M = \frac{r}{n}$ where M is the co-

efficient of mutual induction, and n the frequency of the commutator. The resistance r may be constituted by a standard ohm coil. M. Abraham has found by this method that the coefficient of mutual induction is reciprocal in the case of two circuits free from iron, but that this reciprocity is disturbed if they contain iron cores.—On vision of opaque objects by means of diffracted light, by M. Gouy. If an opaque and non-reflecting object is examined by means of a microscope or telescope, the object being placed in the path of a beam of light, the image is formed both by the rays following geometrical paths and by those diffracted by the outlines of the object. If the former are intercepted, the diffracted rays only form the image. This may be done by placing a small screen at the focus of the object-glass inside the telescope, so as to intercept the rays from a very distant source which converge there. The outline of the object is then seen as a thin bright line on a dark background, and with sufficient enlarging power this line is seen to consist of two, very close together, and separated by a very sharp black line. This black interval disappears on intercepting the diffracted rays either inside or outside the geometrical shadow, thus showing that it is due to the interference of these two beams. They possess a difference of phase of half a wave-length, and equal amplitudes. An arrangement such as this may prove useful when the outlines of an object require to be sharply defined.—On a new method of preparing methyamine and on the constitution of hexamethylene-tetramine, by MM. A. Trillat and Fayollat.—On the alkaline methyl-tartrates and ethyl-tartrates, by M. J. Fayollat.—Researches on the homologues of gallanilide; preparation of galloparatoluide, by M. P. Cazeneuve.—Experimental hereditary influences, by MM. Gley and Charrin.—On a phenomenon of inhibition in Cephalopoda; paralytic constriction of chromatophores, by M. C. Phisalix.—On the serial craniological continuity in the genus *Lepus*, by M. Remy Saint-Loup.—On the genus *Polydora* Bosc (*Leucodora* Johnston), by M. F. Mesnil.—The *Callitraction*, a new reptile of the Permian of Autun, by MM. M. Boule and Ph. Glangeau.—On the glacial and erratic phenomena in the Cachapoal Valley (Andes of Chili), by M. A. F. Nogués. The phenomena of transport by water and glaciers have contributed to the formation of the erratic system in the valleys of the Chili Andes. There must have existed lakes or deep terrace ponds. The glaciers must formerly have descended further than they do at present, and at the Cachapoal they are actually retreating now.—An earthquake shock at Grenoble, by M. Kilian. This happened at 4h. 13m. 40s. A.M., Paris time, on November 5, in a direction from N. to S., and was recorded by the seismometer of the Geological Laboratory of the Faculty of Sciences.

BOOKS, PAMPHLETS, and SERIALS RECEIVED

BOOKS.—Social England: edited by H. D. Traill, vol. i. (Cassell).—New Technical Educator, vol. ii. (Cassell).—Guelphs and Ghibellines: O. Brown (Methuen).—Intensity Coils, 18th edition (Perken). The Magic Lantern, 2nd edition (Perken).—British Fungus Flora: G. Massee, vol. 3 (Bell).—Weather Lore: compiled, &c., by R. Inwards (Stock).—Les Courants Polyphases: J. Rodet et Busquet (Paris, Gauthier-Villars).—Pour Devenir Financier: R. Chevrot (Paris, Gauthier-Villars).—Golf: a Royal and Ancient Game: edited by R. Clark, 2nd edition (Macmillan).—Aberration Problems: Prof. O. J. Lodge (K. Paul).—Eighth Annual Report of the Bureau of Ethnology: J. W. Powell (Washington).—Diamonds and Gold in South Africa: T. Reunert (Stanford).—The Incandescent Lamp and its Manufacture: G. S. Ram ("Electrician" Co.).—Eine Botanische Tropenreise, Prof. Dr. S. Haberlandt (Leipzig, Engelmann).—Der Botanische Garten "s Lands Pinutentuin" zu Buitenzorg auf Java (Leipzig, Engelmann).—Grundzüge der Physiologischen Psychologie: Prof. W. Wundt, Zweiter Band (Leipzig, Engelmann).—Die Allmacht der Naturzüchtung: Prof. A. Weismann (Jena, Fischer).—Australasia, vol. i. —Australia and New Zealand: Dr. A. R. Wallace (Stanford).

PAMPHLETS.—Fenomeni Geodinamici che precedettero, accompagnarono e seguirono l'eruzione Etna del Maggio Guigno 1886, S. Arcidiacono. — Electro-Culture: P. de Puydt (Bruxelles).—Ethnography of the Aran Islands, Co. Galway, A. C. Haddon, and C. R. Browne (Dublin).—Bibliography of the Chinook Languages: J. C. Pilling (Washington).—Catalogue of a Stratigraphical Collection of Canadian Rocks prepared for the World's Columbian Exposition, Chicago 1893: W. F. Ferrier (Ottawa).—Das Karstphänomen: Dr. J. Cvičic (Wien, Hölzel).—Die Biologie als selbständige Grundwissenschaft: H. Driesch (Leipzig, Engelmann).—Tafel des Integrals: B. Kämpfe (Leipzig, Engelmann).—On the Volcanoes and Hot Springs of India: Dr. V. Ball (Dublin).

SERIALS.—Kansas University Quarterly, October (Lawrence, Kansas).—American Journal of Science, November (Newhaven, Conn.).—Bulletins de la Société d'Anthropologie de Paris, Nos. 8 and 9, 1893 (Paris).—L'Astronomie, November (Paris).—Zeitschrift für Wissenschaftliche Zoologie, lvi. Band, 4 Helt (Williams and Norgate).—American Naturalist, October (Philadelphia).—Morphologisches Jahrbuch, 20 Band, 3 Heft (Williams and Norgate).—Physical Society of London, Proceedings, vol. xii. Part 2 (Taylor and Francis).—American Journal of Mathematics, vol. xv. No. 4 (Baltimore).—Proceedings and Transactions of the Queensland Branch of the Royal Geographical Society of Australasia, vol. 8 (Brisbane).

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